



THE NATURALIST.

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NOTICE OF GRAHAM ISLAND.

BY WM. AINSWORTH, ESQ. M. R. S. L.

THE ejection of volcanic masses, or the elevation of the strata of the earth above the level of the soil or sea by natural causes, is of importance, remotely to all theories of the earth, and proximately to the true origin and formation of pseudo and active volcanic rocks and of craters of elevation.

This branch of geological inquiry has received a new impulse from the late researches of De Buch and Elie Beaumont, and every circumstance which tends to give consistency to opinions more or less theoretically deduced, is advantageous to science.

The elevation of Graham Island, in lat. $37^{\circ} 11' N.$, and long. $12^{\circ} 44' E.$, in the Mediterranean Sea, between Pantellaria and Sciacca, which took place in the month of July, 1831, has been observed at different stages of its progress, and has been attended with phenomena of such decided utility to this inquiry, that they will be my excuse for intruding upon your pages some remarks connected with its origin and general character.

The drawings which are represented by pl. iv. are from the pencil of Mr. W. Russell, of His Majesty's Ship St. Vincent, and are *fac similes* of the drawings sent by the same gentleman to His Royal Highness the Duke of Sussex, and since published by Ackermann; and of those transmitted to the Admiralty, and published in the Journal of the Royal Geographical Society. In both these cases the artists have made such alterations,

in rounding the outline and altering the true configuration of the island, as materially to affect their utility in a scientific point of view.

According to published documents, the Neapolitan schooner *Psyche* discovered, on the 12th of July, smoke on the water between Sicily and Pantellaria, where the island is now situated; and, on the 17th of July, the master of the brig *Adelaide*, from London, distinguished fire; and it is probable that at this period the land rose to the surface. On the 18th of the same month, Commander C. H. Swinburne observed, from on board His Majesty's ship *Rapid*, a long irregular column of smoke or steam, accompanied by eruptions of fire, bearing south by east; the town of Marsala bearing by compass east half north 9 miles. On nearing, a small hillock of a dark color was observed a few feet above the sea. The volcano was at this period in a constant state of activity, discharging dust and stones with vast columns of steam. The island appeared to be 70 or 80 yards in its external diameter, and the lip as thin as it could be, consistent with its height, which might be 20 feet above the sea in the highest, and 6 feet in the lowest part, leaving the rest for the diameter of the area within.

From information accompanying Mr. Russell's sketch, it appears that the circumference of the island on the 23d was $\frac{2}{3}$ of a mile. The highest point was 80 feet above the level of the sea, and the jets of water rose to a height of from 800 to 1000 feet, and bore up immense quantities of cinders and stones, which sometimes attained nearly double that height.

On the 3d of August, Captain Senhouse of the St. Vincent effected a landing in the Hind cutter, and hoisted the British flag, calling it Graham Island. The form of the crater was found to be nearly a perfect circle, and complete along its whole circumference except for about 250 yards on its south-eastern side, which were broken and low, not apparently more than 3 feet high. The height of the highest part was found, upon a rough computation, to be 180 feet; the whole circuit of the island was from a mile and a quarter to a mile and a third. It bore the general appearance of two longitudinal hills, connected by intermediate low land sending up smoke and vapor in abundance. The circular basin, the centre of the island, was full of boiling salt water, of a dingy red color; and the vapor was very oppressive, causing nausea and faintness.

Captain Senhouse informs us that the fragments of rock brought away by the Hind cutter are compact and heavy, and that the whole surface of the island is dense and perfectly

hard under the feet. No variety of lava was procured, nor even any jet or streams of lava seen ; and Mr. Osborne, surgeon to His Majesty's ship *Ganges*, states that the substances of which the island is composed, are chiefly ashes, the pulverized remains of coal deprived of its bitumen, iron scoriæ, and a kind of ferruginous clay, or oxidized earth. The scoriæ occur in irregular masses, some compact, dense and sonorous, others light, friable, and amorphous, with metallic lustre, slightly magnetic, barely moving the loadstone. A piece of limestone was also found thrown up with the other substances, having no marks of combustion. There were, according to the same observer, no traces of lava, no terra puzzolana, no pumice, nor other stones, usually found on volcanic hills.

It will at once be observed, in the sketches of the island which are represented by pl. iv., that its appearance differs very much according to the distance at which it is viewed. In Fig. 1, it is the summit of a volcano, a cone of eruption slightly elevated above the level of the sea ; but, on a nearer approach, its form is found to be that of a circular crater with more or less perpendicular walls (Fig. 2.) like most of the craters of elevation surrounding the internal craters of volcanoes, or the islands and insulated formations of supposed similar origin. The internal crater on the left hand side of Fig. 2, which presents the most striking manifestation of this disposition, has been obliterated in the sketch contained in the *Journal of the Royal Geographical Society*, and occupied by smoke and a prodigious flash of lightning.

There is every reason to believe that volcanic eruptions take place at the bottom of the sea, in the same manner as on the surface of a continent ; and Mr. Osborne points out the fact that, in the elevated sides of the external ridge of the island, the sides fall down in abrupt precipices ; and each stratum could be distinctly discerned, the water evaporating having left an incrustation of salt, which now appears a white firm layer, plainly marking the regular progress and formation of the island. It is very evident that this kind of action and succession could not have taken place above the level of the waters either of the sea or of the internal crater ; as it further demonstrates that horizontal beds of volcanic matters, accumulated over each other, can be directed on a given point without any violent contortion or derangement of their symmetry and parallelism. Nor have we, in the present case, any invasion of the sea or explosions posterior to the formation of the cone, if we may judge from the details transmitted to us of the elevation and appearance of the island, to account for the well

characterised circus or mural precipice which surrounds the canal of communication or crater of eruption.

It does not farther appear, from the soundings, that this island is the summit of a cone of eruption with an open crater. Captain Swinburne found, within 20 yards on the western side, 18 fathoms soft bottom; and Capt. Smith found, at 100 yards, the island bearing from N. to N. W., from 60 to 64 fathoms; at 80 yards, the island bearing N. E., 70 to 75 fathoms; at 150 yards, the island bearing E., 62 fathoms, cinders: the soundings continuing the same to the distance of five or six miles; that is to say, varying from 60 to 70 and 80 fathoms, sand and small gravel. The extent of the action by which this island was elevated from below is uncertain. It is a curious fact, that the tides were higher at that period at Gibraltar than they were ever known to be; but the connection of this phenomenon with the elevation of submarine formations requires the evidence of correlative observations.

Captain Swinburne observed the interior of the crater to be filled with muddy water, violently agitated, dashing up and down, and shooting hot stones and cinders into the air; and occasionally running into the sea, over the edge of the crater, which was broken down to the level of the sea on the west-south-west side for the space of 10 or 12 yards. This edge he supposed, from these appearances, to be formed of cinders and mud: a supposition which is contradicted by the consideration that an embankment of such materials, and of such slight thickness, could never retain the mass so violently agitated in the interior; and is farther opposed to the statements of Captain Senhouse and Mr. Osborne.

The isolation of the volcanic action is also demonstrated by the fact, that the temperature of the sea, within 10 or 12 yards of the crater, was only 1° higher than the average; and to the leeward, in the direction of the current, it was not at all affected, though a *mirage* played on the island.

There was at a subsequent period of the eruption, on the south-west side of the island, adjoining the principal crater, a terrific ebullition and agitation of the sea, apparently seated in another canal of communication; attended by the emission of a dense white steam, and a temperature increased to 190° Fahr.; and the information has, I believe, since reached the Admiralty, that this crater is now elevated above the level of the waters. De Buch has already pointed out, that the internal action which manifests itself at the surface of the soil or sea by a crater of elevation, may constitute at the same time a permanent volcanic crater beneath; the eruptions of which

may take place sometimes by the centre of the crater of elevation, sometimes by neighboring points.

Though it is difficult, from the meagre details hitherto obtained, to form any correct opinion of the mineralogical character of the upraised mass, yet there is nothing in those details to warrant the supposition that there is no stability or permanence in the composition of the island. The pulverized remains of coal deprived of its bitumen, the hard scoria, dense and sonorous (phonolites?) the amorphous rocks with metallic lustre and ironstone clay, would appear to associate the eruption with the rocks of the carboniferous series—an opinion which receives additional probability from the ejection of unchanged pieces of limestone; as we see, between Pettycur and Bruntisland in Fifeshire, beds of limestone and of non-bituminous coal elevated by rocks of plutonic origin, and argillaceous and argillo-calcareous rocks changed into leucostines and spilites.—*Magazine of Natural History*.

NOTE.—The last account of this island states that it exists no more since the 20th of December last, when it sunk at the time of a violent earthquake. At the place where it was situated there now remains a kind of rock covered with a shallow depth of water.

ED.

CONCHOLOGY.

NO. II.

OF THE CONSTITUENT PARTS OF SHELLS. The nature and component parts of testaceous substances have been particularly investigated by Mr. Hatchett, from whose paper we extract the following observations.

In his examination of marine shells, Mr. Hatchett found, from the nature of the substance of which they are composed, that they might be arranged in two divisions.

Under the first are included those which have a porcellaneous appearance and enamelled surface, and exhibit, when broken, something of a fibrous texture. The other division is distinguished, by having a strong epidermis or covering, under which is the shell, composed principally or entirely of mother of pearl. To the first division belong different species of voluta, cypræa, and others. The second comprehends the oyster, the river muscle, and some species of haliotis and turbo.

Porcellaneous Shells. The shells of this description

which were examined, were different species of voluta and cypræa. When they were exposed to a red heat for a quarter of an hour, they crackled and lost the colors of their enamelled surface. No apparent smoke, and no smell, like that of burnt horn or cartilage, were emitted during the process. The figure remained the same, excepting a few flaws; and they became of an opaque white, partially tinged with pale gray. When they were dissolved in acids, after being burnt, they deposited a small quantity of animal coal, which proves that they contain some portion of gluten. Shells, which had not been exposed to the fire, dissolved with great effervescence in the different acids, and the solution remained transparent and colorless; from which it appears, that the proportion of gluten is small, since it could not be traced in the solution of the unburnt shells.

In examining the different solutions of shells, whether burnt or unburnt, by chemical tests, it was found that no trace of phosphate of lime, or of any other combination of phosphoric acid, existed in these substances; and it appeared, from many experiments, that the component parts of porcellaneous shells are carbonate of lime, cemented with very small portions of animal gluten.

Some species of patella, which were brought from Madeira, were also subjected to chemical examination by the same philosopher. When exposed to a red heat, in a crucible, they emitted a perceptible smell of burnt horn or feathers; and, by farther examination, by solution, the proportion of carbonic matter deposited, appeared to be greater, and the proportion of carbonate of lime less, than what was indicated by the result of the experiments on porcellaneous shells. When unburnt shells, belonging to the same species, were immersed in nitric acid, very much diluted, the epidermis separated, and the whole of the carbonate of lime was dissolved. A gelatinous substance, nearly in a liquid state, remained, but it did not retain the figure of the shell, and exhibited no appearance of a fibrous structure. These shells, therefore, contain a larger portion of gelatinous matter than the porcellaneous shells; but the other component part consists entirely of carbonate of lime.

Shells composed of Mother of Pearl. Shells of this description were subjected to similar experiments with the former. When the common oyster was exposed to a red heat, the effects were the same as those which were produced by the same process on the species of patella from Madeira.

The solution of the unburnt shell was also similar, excepting only that the gelatinous part was of a greater consistency. When the river muscle was burnt in a crucible, it emitted much smoke, with a strong smell of burnt horn or cartilage ; the shell became of a dark gray color, and exfoliated. By solution in the acids, the proportion of carbonic matter separated was greater, and that of carbonate of lime obtained was less, than from the other shells on which experiments were made.

When an unburnt shell of this description was immersed in diluted nitric acid, a rapid solution and effervescence took place, and, at the end of two days, the whole of the carbonate of lime was nearly dissolved. A series of membranes now only remained, of which the epidermis constituted the first. These membranes still retained the figure of the shell. The carbonate of lime was at first readily dissolved, because the acid came easily in contact with it ; but the process became slower as it was more difficult for the acid to insinuate itself between the different membranes of which the shell is composed. The *Haliotis iris*, and the *Turbo olearius*, were found to resemble this muscle, except that the membranaceous parts were more compact and dense.

When these shells are deprived, by an acid, of the carbonate of lime, which gives them their hardness, they appear to be formed of different membranes, applied stratum super stratum. Each membrane is furnished with a corresponding coat or crust of carbonate of lime, and it is so situated, that it is always between every two membranes, beginning with the epidermis, and ending with the internal membrane, which has been last formed. The animals which inhabit these stratified shells, increase their habitation by the addition of a stratum of carbonate of lime, which is secured by a new membrane. And, as every additional stratum exceeds in extent that which was previously formed, the shell becomes stronger in proportion as it is enlarged ; and thus the growth and age of the animal may be denoted by the number of strata of which the shell is composed. Similar experiments were made on species of mother of pearl, as they are imported from China, and with precisely the same results. They appeared to be composed of the same gelatinous matter, and carbonate of lime. In all the shells of this description which were immersed in acids, the membranaceous parts retained the exact figure of the shell, and they appeared distinctly to be composed of fibres, arranged in a parallel direction, corresponding to the configuration of the shell.

Pearl. The constituent parts of pearl appear to be similar to those of mother of pearl. They are composed of concentric coats of membrane and carbonate of lime, and resemble, in structure, the globular, calcareous concretions, which are known by the name of *pisolithes*. The iridescence and undulated appearance of pearl and mother of pearl, evidently depend on their lamellated structure and semi-transparency. From these experiments, it appears that shells are composed of carbonate of lime and gluten. In some, as in the porcellaneous shells, the proportion of carbonate of lime is great, while that of the animal matter is small; and these may be regarded as the beginning of the series, while shells that come under the description of mother of pearl are to be placed at the other extremity, having a smaller proportion of carbonate of lime, and a greater proportion of membranaceous substance. In the first, the carbonate of lime is nearly cemented by the animal matter; in the latter, the carbonate of lime serves to harden the membranaceous substance. But between these two extremes, in the proportion of carbonate of lime and animal gluten, of which all testaceous substances are composed, there are, no doubt, numerous intermediate gradations, arising from the nature of the animal to which they form a covering, its peculiar habits, or mode of life.

ORNITHOLOGY.

NO. IV.

SONG OF BIRDS. As the song of birds is not allowed to be the effect of love, by an honorable author on the subject of singing birds,* we shall endeavor to elucidate this matter from experiments on birds, in their natural wild state; and also endeavor to prove that their notes are innate, contrary to that author's opinion. That confined birds will learn the song of others they are constantly kept with, there is no doubt; but then it is generally blended with that peculiar to the species. In the spring, the very great exertions of the male birds in their vociferous notes are certainly the calls to love; and the peculiar note of each is an unerring mark for each to discover its own species. If a confined bird had learned the song of another, without retaining any part of its natural

* Daines Barrington.

notes, as was set at liberty, it is probable it would never find a mate of its own species ; and even supposing it did, there is no reason to believe the young of that bird would be destitute of its native notes ; for if nestling birds have no innate notes peculiar to the species, and their song is only learned from the parent bird, how are we to account for the invariable notes each species possess, when it happens that two different species are bred up in the same bush, or in one very contiguous, or when hatched or fostered by a different species ? There is every reason to believe it is necessary that there should be native notes peculiar to each species, or the sexes might have some difficulty in discovering each other, the species be intermixed, and a variety of *mules* produced ; for we cannot suppose birds discriminate the colors by which their species are known, because some distinct species are so exactly alike that a mixture might take place. The males of song birds, and many others, do not in general search for the female, but, on the contrary, their business in the spring is to perch on some conspicuous spot, breathing out their full and amorous notes, which, by instinct, the female knows, and repairs to the spot to choose her mate. This is particularly verified with respect to the summer birds of passage. The nightingale, and most of its genus, although timid and shy to a great degree, mount aloft, and incessantly pour forth their amorous strains, each seemingly vieing in its love-labored song before the females arrive. No sooner do they make their appearance than dreadful battles ensue, and their notes are considerably changed ; sometimes their song is hurried through without the usual grace and elegance ; at other times modulated into a soothing melody. The first we conceive to be a provocation to battle on the sight of another male ; the last an amorous cadence, a courting address. This variety of song lasts no longer than till the female is fixed in her choice, which is in general in a few days after her arrival ; and if the season is favorable, she soon begins the task allotted to her sex.

The male now no more exposes himself to sing as before, nor are his songs heard so frequently, or so loud ; but while the female is searching for a secure place to build a nest he is no less assiduous in attending her with ridiculous gestures, accompanied with notes peculiarly soft. When the female has chosen a spot for nidification, the male constantly attends her flight to and from the place, and sits upon some branch near, while his mate instinctively places the small portion of material she each time brings to rear a

commodious fabric for her intended brood. When the building is complete, and she has laid her portion of eggs, incubation immediately takes place. The male is now heard loud again, but not near so frequently as at first; he never rambles from her hearing, and seldom from her sight; if she leaves her nest he soon perceives it, and pursues her, sometimes accompanied with soft notes of love. When the callow brood appear, he is instantly apprised of it, either by instinct or by the female carrying away the fragment shells to some distant place. The male is now no more heard in the tuneful glee, unless a second brood should force the amorous song again; his whole care and attention is now taken up in satisfying the nutrimental calls of his tender infant race, which he does with no less assiduity than his mate, carrying them food, and returning frequently with muting of the young in his beak, which is dropped at a distance from the nest. Here we must beg leave to digress for a moment to remark, that, with the utmost attention, we have never been able to discover the parent birds giving their young a musical lesson; and much question if the late brood of many species ever hear the song of their parents, till they join chorus the ensuing spring, when they also feel the impulse of love, the great dictate of nature.

The continuation of song in caged birds, by no means proves it is not occasioned by the stimulus of love; indeed, it is likely the redundancy of animal matter, from plenty of food and artificial heat, may produce it; and this is sufficient reason for continuing their song longer than birds in their natural wild state, because they have a constant stimulus; whereas wild birds have it abated by a commerce with the other sex, by which, and other causes, it is prevented. It is true wild birds are heard to sing sometimes in the middle of winter when the air is mild, animated by the genial warmth of the sun, which acts as a stimulus.

Syme's remarks on the songs of birds are worth quoting. 'The notes,' says he, 'of soft-billed birds, are finely toned, mellow and plaintive; those of the hard-billed species are sprightly, cheerful and rapid. The difference proceeds from the construction of the larynx; as a large pipe of an organ produces a deeper and more mellow-toned note than a small pipe, so the *trachea* of the nightingale, which is wider than that of the Canary, sends forth a deeper and more mellow-toned note. Soft-billed birds, also, sing more from the lower part of the throat than the hard-billed species. This, together with the greater width of the larynx of the nightingale and

other soft-billed warblers, fully accounts for their soft, round, mellow notes, compared with the shrill, sharp and clear ones of the Canary and other hard-billed songsters. In a comprehensive sense, the complete song of birds includes all the notes they are capable of uttering; and, taken in this sense, it is analogous to the speech of man. It is the vehicle through which these little creatures communicate and convey to each other their mutual wishes and wants. It may be divided into six distinct separate sounds or parts, each of which is very expressive, even to us, of the feelings which agitate the bird at the moment. To describe their song more fully, we shall divide it in the following manner: *First*, the call note of the male in spring; *second*, the loud, clear, ardent, fierce notes of defence; *third*, the soft, tender, full, melodious, love warble; *fourth*, the notes of fear or alarm, when danger approaches the nest; *fifth*, the note of alarm or war cry, when a bird of prey appears; *sixth*, the note the parent birds utter to their brood, and the chirp or note of the young. The note of the young may be again divided into two,—that which they utter while in the nest, and the chirp after they leave it,—for they are very distinct sounds or notes; to which may be added, a soft, murmuring kind of note, omitted by the male while he is feeding the female in the nest; and also by her while she is receiving the food. The call note, the warble of love, and the notes of defiance, or prelude to battle, seem only to be understood by birds of the same species, at least in a wild state. Perhaps in a state of domestication, birds of different genera, if nearly allied, may partially comprehend these notes, as the canary bird does the notes of the siskin, the goldfinch and the linnet. But this, we think, is more occasioned by necessity than by choice in these birds; and, in this case, it is man who breaks down the barriers which nature has so wisely put between different species. The note of fear or alarm of the cock bird, by which he gives notice to the hen of the approach of danger near the nest, and which she perfectly understands—for she either keeps close, or quietly makes her escape; this note, we think, is only comprehended by birds of the same species, though we have certainly seen birds of different genera appear as if alarmed by this note of fear, sounded by a bird of different species and genus; but whether it was the note that alarmed them, or our presence, we cannot say. But we are pretty sure, the notes of parent birds, and the chirp of the young, are only understood by birds of the same species, or rather we should say, family, for it appears to be a family language,

understood reciprocally by parent birds and their young ; for the young know the notes of their parents, and the parents of their own brood, among all the young broods of other birds of the same species in the neighborhood, and this they do, as distinctly as the ewe knows the bleat of her own lamb, or the lamb the cry of its own mother, among a large flock. With regard to the note of alarm, birds send forth on the approach of their natural enemies, whether a hawk, an owl or a cat, we consider it to be a general language perfectly understood by all small birds, though each species has a note peculiar to itself. This note differs in sound from the note of fear or alarm, given by them when man approaches near their nest. This last seems confined to a species ; but this general alarm note, (which is understood by all small birds,) we would call their war whoop or gathering cry, for it is a true natural slogan. All the notes comprised in the song of birds convey delight to the mind of a lover of nature ; but the bird fancier only prizes their love warble, and notes of defiance ; these notes, and these only, he considers to be their song. The musical notes of birds, whether of love or war, are sweet, and really charming in themselves ; but they perhaps pour on the mind a greater degree of pleasure than mere sound is capable of conveying—we mean the recollections of youthful days, of endearing incidents, or of scenes connected with country pleasure. We ourselves prefer the mellow, plaintive melody of the soft-billed species ; but others give the palm to the cheerful warble of the hard-billed tribe : which of these two styles is the sweetest melody we cannot determine. Both warbles may be equally fine ; and the preference, perhaps, may depend on taste and feeling. But it is allowed, by all who have an ear for music, or rather we should say, who have an ear and love for simple, natural melody, that the song or warble of birds is truly delightful ; but all their musical notes cease as soon as the brood is hatched.'

We may be permitted to inquire, since birds sing in a pitch so irregular, and with intervals so unsettled, exhibiting a total disregard to measure and rhyme, what makes their music pleasing ? The cause has been traced to association ; for they sing but in fine weather, and when pleased ; and for the last reason, even the *sostenuto* of the cat is not unpleasing. The variety and rapidity of their notes and intonation also awakens attention ; and the contrast between rapid flights of double-demi-semi-quavers, and lengthened and sweet minims, is often wonderful ; such as the soft and sustained notes of the nightingale, succeeded by a short and expressive passage

of quicker sound. It is, perhaps, too much to say, that we have borrowed all our music from birds ; but some of it is evidently a plagiarism.

The cuckoo itself has done more for our music than musicians may be willing to allow, but it is no more than just to a despised bird to say, that from it we have derived the *minor scale*, whose origin has puzzled so many,—the cuckoo's couplet being the *minor third* sung downwards.

CABINET CYCLOPÆDIA.

SILK MANUFACTURE.

NO. IV.

MODE OF REARING SILK WORMS IN CHINA. ‘Before entering upon any description of the methods practised in Europe for rearing silk worms, it appears desirable to give a brief account of the means employed for that end in China. It will be seen, from this sketch, how superior, in many respects, were the arrangements of the Chinese cultivators ; and that in departing from the course so long pursued by them, Europeans made choice of modes less rational and simple for attaining the desired result. The inquiries and experiments of later days have brought us back from the confused procedures, which so long imparted uncertainty, and so frequently led to disappointment, and have introduced, instead, judicious and methodical arrangements.

‘In those parts of the empire where the climate is favorable to the practice, and where alone, most probably, the silk worm is indigenous, it remains at liberty, feeding at pleasure on the leaves of its native mulberry tree, and going through all its mutations among the branches, uncontrolled by the hand and unassisted by the cares of man. So soon, however, as the silken balls have been constructed, they are appropriated by the universal usurper, who spares only the few required to reproduce their numbers, and thus to furnish him with successive harvests.*

‘This silk, the spontaneous offering of nature, is not, however, equal in fineness to that which is spun by worms under shelter, and whose progressions are influenced by careful attendance. Much attention is, therefore, bestowed by the

* For the description of the silk worm, see *Naturalist*, Vol. I.

Chinese in the artificial rearing of silk worms. One of their principal cares is to prevent the too early hatching of the eggs, to which the nature of the climate so strongly disposes them. The mode of ensuring the requisite delay is, to cause the moth to deposit her eggs on large sheets of paper: these, immediately on their production, are suspended to a beam of the room, and the windows are opened to expose them to the air. In a few days the papers are taken down and rolled up loosely with the eggs within-side, in which form they are hung again during the remainder of the summer and through the autumn. Towards the end of the year they are immersed in cold water wherein a small portion of salt has been dissolved. In this state the eggs are left during two days; and on being taken from the salt and water are first hung to dry, and are then rolled up rather more tightly than before, each sheet of paper being thereafter inclosed in a separate earthen vessel. Some persons, who are exceedingly particular in their processes, use a ley made of mulberry tree ashes, and place the eggs likewise, during some minutes, on snow water, or otherwise on a mulberry tree exposed to snow or rain.

These processes appear efficacious for checking the hatching, until the expanding leaves of the mulberry tree give notice to the rearer of silk worms, that he may take measures for bringing forth his brood. For this purpose the rolls of paper are taken from the earthen vessels, and are hung up towards the sun, the side to which the eggs adhere being turned from its rays, which are transmitted to them through the paper. In the evening the sheets are rolled closely up and placed in a warm situation. The same proceeding is repeated on the following day, when the eggs assume a grayish color. On the evening of the third day, after a similar exposure, they are found to be of a much darker color, nearly approaching to black; and the following morning, on the paper being unrolled, they are seen covered with worms. In the higher latitudes the Chinese have recourse to the heat of stoves, to promote the simultaneous hatching of eggs.

The apartments in which the worms are kept stand in dry situations, in a pure atmosphere, and apart from all noise, which is thought to be annoying to the worms, and especially when they are young. The rooms are made very close, but adequate means of ventilation are provided: the doors open to the south. Each chamber is provided with nine or ten rows of frames, placed one above the other. On these frames rush hurdles are ranged, upon which the worms are fed through all their five ages. A uniform degree of heat is constantly pre-

served, either by means of stoves placed in the corners of the apartments, or by chafing dishes which from time to time are carried up and down the room. Flame and smoke are always carefully avoided : cow dung dried in the sun is preferred by the Chinese to all other kinds of fuel for this purpose.

‘ The most unremitting attention is paid to the wants of the worms, which are fed during the night as well as the day. On the day of their being hatched they are furnished with forty meals, thirty are given in the second day, and fewer in and after the third day. The Chinese believe that the growth of silk worms is accelerated, and their success promoted, by the abundance of their food ; and therefore, in cloudy and damp weather, when the insects are injuriously affected by the state of the atmosphere, their appetites are stimulated by a wisp of very dry straw being lighted and held over them, by means of which the cold and damp air is dissipated.

‘ It is affirmed by these accurate observers, that the quicker the worm arrives at its maturity, the greater is the quantity of silk which it spins. They say, that if the worms become fully grown in twenty-five days, each drachm of eggs will produce twenty-five ounces of silk ; that if their maturity be delayed to the twenty-eighth day, only twenty ounces are obtained ; and that if thirty or forty days elapse between the hatching and the commencement of the cocoons, then only ten ounces are the result.

‘ The Chinese are exceedingly careful in preserving the nicest degree of cleanliness in their establishments for rearing silk worms ; being fully aware of the great importance which attaches to that particular.

‘ The worms, as they increase in growth, have gradually more space assigned to them ; so that the full-grown caterpillars have four times the scope that is allotted to them when newly hatched, and sometimes even more.

‘ When the insects are about to commence their spinning, mats are provided, in the centre of which a strip of rush, about an inch broad, is fixed, and extended in a spiral form, or in concentric circles, over the whole surface of the mat, leaving an area of about an inch broad between each circle. Here the worms fix themselves to spin ; and it is found that these receptacles occasion less silk to be wasted by them in floss, than when more space is allotted wherein their first threads can be spun. At this time the whole room is carefully covered with mats, to exclude the outward air and the light, as it is believed that silk worms work more diligently in darkness.

'In seven days from the commencement of the cocoons, they are collected in heaps; those which are designed to continue the breed being first selected and set apart on hurdles, in a dry and airy situation. The next care is to destroy the vitality of the chrysalides in those balls which are to be reeled. The most approved method of performing this is to fill large earthen vessels with cocoons, in layers, throwing in one fortieth part of their weight of salt upon each layer, covering the whole with large dry leaves resembling those of the water lily, and then closely stopping the mouths of the vessels. In reeling their silk, the Chinese separate the thick and dark from the long and glittering white cocoons, as the produce of the former is inferior.'

'In India, the climate admits of silk worms being reared in buildings resembling sheds rather than houses. They are composed of lattice work, and their roofs are covered with thatch. The breadth of such buildings is usually fifteen feet, and their height eight feet; their length is regulated by the extent of accommodation required. In the centre of the apartment a path is left, of convenient width for the attendants to pass and repass in supplying the wants of their charge; and on either side are twelve tiers or stages, one above another, of open frame work, or shallow boxes made of bamboo, in which the worms are placed. When ready to spin, each worm is individually transferred to a small cell formed with platted strips of bamboo.'

MEDICINAL PROPERTIES OF TOBACCO.

THESE are considered to be those of a powerful *narcotic, antispasmodic, emetic, cathartic, sudorific, and diuretic.*

'As a *narcotic*, it is endued with the most energetic, poisonous properties, producing, when administered even in small doses, severe nausea and vomiting, cold sweats, universal tremors, with extreme muscular debility.' From its exerting a peculiar action on the nervous system, as ascertained by the well-directed experiments of Mr. Brodie, it powerfully controls the action of the heart and arteries, producing invariably a weak, tremulous pulse, with all the apparent symptoms of approaching death. And so different is its operation from that of other narcotics, that it actually operates with more destructive efficacy, when used by way of injection,

than when applied either to the skin, or when taken into the stomach.

From what has been said of its narcotic powers, you, Gentlemen, will readily infer its virtue as an article of *medicine*. If we wish, at any time, to prostrate the powers of life in the most sudden and awful manner, we have but to administer a dose of tobacco, and our object is accomplished. Hence its use in obstinate constipation, in cholic, in the iliac passion, and in stranguary.

As it is conceded that its efficacy as an *antispasmodic* depends upon its power to prostrate every vestige of tone and elasticity in the muscular fibre, prudence would dictate that it should be used with the utmost circumspection, when the system had been previously exhausted by the disease, or by the antecedent method of cure. Melancholy instances are on record, of the fatal effects of this medicine when administered without this caution, both as an internal remedy, and as an external application in cutaneous diseases. Two instances will suffice.

‘A medical practitioner,’ says Paris, ‘after repeated trials to reduce a strangulated hernia, injected an infusion of tobacco, and shortly after sent the patient in a carriage to the Westminster Hospital, for the purpose of undergoing the operation; but the unfortunate man arrived only a few minutes before he expired.’

‘I knew a woman,’ says the same learned author, ‘who applied to the heads of three of her children, afflicted with scald-head, an ointment composed of snuff and butter; but what was the poor woman’s surprise, to find them immediately seized with vertigo, violent vomiting, fainting, and convulsions.’

We next come to its effects as an *emetic*. ‘As such,’ says Professor Chapman, ‘tobacco claims our attention.’ Cullen and many others opposed its use, on account of the harshness of its operation. Certainly it exceeds all others in the promptness, violence and permanence of its impressions. But these very qualities, unpleasant as they are, enhance its value in many cases.’

‘Tobacco seems especially to be adapted to the evacuation of some poisons; and it has this advantage, that it acts with equal certainty and expedition, when applied to the region of the stomach in the form of a poultice, as when internally administered.’ Professor Barton says, he had recourse to an application of the moistened leaves of this plant to the region of the stomach, with complete success, to expel an

inordinate quantity of laudanum, in a case where the most active emetics, in the largest doses, were resorted to in vain. But most poisons, particularly the corrosive, are attended with so much exhaustion, that it would seem perilous to administer tobacco, lest by its own depressing effects, the powers of vitality might be irrecoverably extinguished. In many instances, however, it appears that it may be administered in small doses with safety and advantage.

We are informed by a respectable writer, that while at the Cape of Good Hope, he had a number of Hottentots, with intermittent fever, under his care. Having few medicines, he resorted to tobacco, and found six grains of snuff as effectual in exciting vomiting, as two of Tartar emetic.

By many it is preferred in minute doses, as a nauseating medicine. Thus administered, it has succeeded in subduing some of the most violent symptoms of the most furious cases of mania; and where it cannot be given by the mouth, from the obstinacy of the patient, it may with equal benefit be applied in the form of a poultice.

As a *cathartic*, tobacco is entitled to notice. 'Some physicians have been in the habit of prescribing this powerful substance not only for the more dangerous cases of incarcerated hernia, but in all cases of obstinate constipation, from whatever cause produced. To relieve these painful diseases, it has been usually given in the form of a clyster, regulating the dose to the age, circumstances and strength of the patient; and it is affirmed to have proved, in many instances, very effectual, and to possess the confidence of practitioners.'

I was informed by a learned and ingenious friend, that, having an obstinate case of ascaris lumbricoides in his own family, after repeated unsuccessful efforts to dislodge the worms, he at last had recourse to this potent remedy, a poultice of which he applied to the region of the stomach. The worms were almost instantaneously expelled, but with very alarming symptoms, and a complete prostration of the patient. From these circumstances, we should be led to conclude, that its efficacy as a vermifuge depends either upon its narcotic properties, or upon its sudden and powerful effect as a cathartic.

Its effects as a *sternutatory*, that is, as exciting to sneeze, are known to all. If applied to the nostrils, in the form of a powder or snuff, it produces violent and repeated sneezing, with a slight degree of vertigo. The violent agitation produced in this way, together with a copious discharge from the nostrils, often relieves catarrh, headache, and incipient

ophthalmia or inflammation of the eyes. But habit soon blunts the sensibility of the organs, and much positive injury follows the habitual use of snuff. It has been a popular remedy in many places for the cure of scald-head, psora, and most other cutaneous eruptions. It has also been applied for cleansing ulcers, and for the removal of indolent tumors. But the dreadful effects produced by it when absorbed into the system, have induced most medical men to abandon it altogether, and prescribe a more safe application.

Though it is said, by Dr. Brailsford, to be a *sudorific* of considerable efficacy, I am in possession of no facts which go to support such a conclusion, unless it be the fact, that it in an eminent degree brings on that cold perspiration of which we have spoken, and which is, in many instances, the immediate precursor of death.

But of all others, its *diuretic* properties have been the most lauded. Dr. Fowler was the first to bring them extensively into notice. In dropsy, dysury, gravel and nephritis calculosa or inflammation of the kidneys, the infusion and tincture were given by him with astonishing success. In spasmodyc asthma, the same distinguished physician found it to afford relief.

Mr. Earle, a surgeon of some eminence, has more recently treated several inveterate cases of retention of urine on the same plan and with similar effects, and adds his testimony to its efficacy in testanus, trismus, and other spasmodyc affections. Of its power to relieve spasm there can be no doubt. What has been related of its sedative qualities, is abundantly sufficient to establish that fact. Cramps, convulsions, and even the vital principle itself, give away before the exhibition of this deadly narcotic. Hence, to its power of prostrating the muscular enegy, it owes its efficacy in preventing retention of urine.

We have now gone through with an examination of the medicinal properties of tobacco, and have arrived at the following conclusion, viz. that few substances are capable of exerting effects so sudden and destructive, as this poisonous plant. Prick the skin of a mouse with a needle, the point of which has been dipped in its essential oil, and immediately it swells and dies. Introduce a piece of common 'twist,' as large as a kidney bean, into the mouth of a robust man, unaccustomed to this weed, and soon he is affected with fainting, vertigo, nausea, vomiting, and loss of vision. At length the surface becomes deadly pale, the cold sweat gathers thick upon his brow, the pulse flutters or ceases to

beat, a universal tremor comes on, with slight spasms and *other* symptoms of dissolution. As an emetic, few articles can compare with it for the promptness and efficiency of its operation ; at the same time there are none which produce such universal debility. As a cathartic, it produces immediate and copious evacuations, with great prostration of strength ; but its dose can with difficulty be regulated.

If such be a fair statement of its effects on the human system ; if it requires all the skill of the most experienced practitioner to guard against those sudden depressions which uniformly follow its use, when administered with the utmost circumspection ; and if, with all this caution, its operation is still followed by the most alarming, and even fatal consequences—what shall we say of those who habitually subject their constitutions to the destructive influence of this worse than 'Bohan Upas' ?

To an individual unacquainted with the fact, it would seem incredible that a weed, possessed of properties so poisonous, should ever have been sought as an article of luxury. Yet it has not only been sought, but even credulity startles at the extent to which it has been used. 'Like opium it calms the agitations of our corporeal frame, and soothes the anxieties and distresses of the mind.' Its powers are felt and its fascinations acknowledged, by all the intermediate grades of society, from the sot who wallows in the mire of your streets, to the clergyman who stands forth a pattern of moral excellence, and who ministers at the altar of God. For it the Arab will traverse, unwearied, his burning deserts ; and the Icelander risk his life amidst perpetual snows. Its charms are experienced alike, by the savage who roams the wilds of an American forest, and the courtier who rolls in luxury and prescribes rules of refinement to the civilized world ; by the miscreant who wrings from the cold hand of charity the pittance that sustains his life, and the monarch who sways his sceptre over half the globe ; by him who is bent with woes and years, and him whose cheek is covered yet with boyhood's down. Hence we might conclude it capable of giving strength to the weary, vivacity to the stupid, and wisdom to men void of understanding ; capable of soothing the sorrows of the afflicted, of healing the wounds of the spirit, and assuaging the anguish of a broken heart. But how it fulfils these desirable indications, will be our next business to inquire.

Tobacco, as a luxury, has been used for the last two centuries over all the civilized, and the greater portion of the uncivilized world. The modes have been *snuffing, smoking*

and *chewing*. Its effects, when habitually used in each of these modes, will now be examined. As far as my observations extend, few, if any, of all the devotees to this stupifying substance, ever resort to its use without some supposed necessity ; and often, alas *too often*, by the advice of physicians.

The benefit to be derived from the exhibition of a medicine in the cure of disease, should not alone induce us to prescribe it, without due regard to the injury which may result to the constitution. Had this rule been observed relative to the subject under consideration, I apprehend the use of this baneful drug would have been less extensive.

Snuff has been prescribed for a variety of complaints, among which are headache, catarrh, and some species of ophthalmia, and no doubt sometimes with very good effect ; as I have, in a very few instances, witnessed. But the fact seems to have been overlooked, that its only power to relieve these complaints arises from the copious discharge of mucus from the nostrils, during the violent paroxysm of sneezing which invariably attends its first application ; and that its salutary influence ceases, whenever these peculiar effects cease to accompany its exhibition. Hence in all cases where it is continued an indefinite time, or until the Schneiderian membrane loses its sensibility, it not only fails of its medicinal effect, but actually becomes pernicious ; aggravating the very disease it was intended to cure. It not only does this, but goes on committing great ravages on the whole nervous system, superinducing hypocondria, tremors, and premature decay of all the intellectual powers. A thickening of the voice, is also the unavoidable result of habitual snuff-taking. This disagreeable consequence is produced, either by partially filling up the nasal avenues, or by destroying the sensibility of the parts. Be that as it may, we would say of the change, in the forcible language of Cowper : 'O ! it is fulsome, and offends me more than the nasal twang, heard at conventicle from the pent nostril, spectacle bestrid.'

It also occasions loss of appetite, frequent sickness at the stomach, with many other disagreeable symptoms. A case in point, is related by Dr. Cullen, of a woman, who had been in the habit for twenty years. At length she found on taking a pinch before dinner, she had no appetite. This having frequently occurred, she was induced to postpone her pinch till after dinner, when she ate her meal with her accustomed relish, and went on snuff-taking in the afternoon without inconvenience.

Another instance is related by the same author, of the injurious effects of this habit. A lady, who had been accustomed to take snuff freely, was seized with a severe pain in her stomach, which continued unabated notwithstanding many remedies were applied; until accidentally her snuff was omitted for a few days, when the pain was found to subside, and did not return until she again had recourse to her snuff. Then, to her utter astonishment, it immediately came with all its former severity, and would yield to no treatment without a relinquishment of the snuff-box, which (strange to tell) the woman laid aside, and recovered her health.

Most persons in the constant habit of taking snuff, are led on insensibly, until they consume enormous quantities. But as they are accustomed both to its stimulant and narcotic effects, they are not aware of the pernicious consequences. In the midst of interesting conversation, they frequently transcend the bounds assigned them by habit, and the consequence is, sickness, faintness and trembling, with some vertigo and confusion of head. During this paroxysm of snuffing, particles of the powdered tobacco are carried back into the fauces, and thence into the stomach; which occasions not only sickness at the time, but is long after followed with dyspepsia and other symptoms of disordered abdominal viscera.

The second mode of habitually using this drug, is *smoking*. This, too, has been prescribed by reputable members of the faculty. And for what purpose has this disgusting practice been recommended? 'For weakness of the stomach,' to be sure. Persons who have a craving appetite, and consume more food, particularly at dinner, than their stomach will readily digest, experience considerable uneasiness for some time after eating. The mouth and fauces sympathize with the overloaded organ, and an increased quantity of fluid is poured from the mucous follicles and salivary glands, to aid in the process of digestion. Under these accumulating difficulties, the man calls on the '*Doctor*,' who very wisely imagines these symptoms are sufficient evidence that he has a 'weak and watery stomach,' and the pipe and cigar are recommended to carry off the superabundant humors, which still are unable to assimilate the enormous load with which, from time to time, the stomach is crowded. But as the application of the burnt oil of tobacco to the mouth and fauces, from its stimulant and narcotic qualities, numbs the senses and renders the individual less conscious of his distress, he takes it for granted that he is materially relieved, and knows not, poor man, that it is all delusion. Thus, instead

of taking the only rational method, that of adapting the quantity of food to the powers of digestion, he pursues a course which continues to weaken the organs of digestion and assimilation, and at length plunges him into all the accumulated horrors of dyspepsia, with a complete prostration of the nervous system.

But it has been said that smoking will cure the toothache ; and we should have recourse to any means for the removal of so painful a disease. That it will, as a powerful sedative, lessen the pain, and sometimes even altogether remove toothache, is probably true ; but why continue the practice after the occasion has ceased ? Opium and calomel, judiciously administered, will relieve *cholera morbus* ; but whoever thought of making them an article of diet, because from their application he had experienced relief in that dangerous complaint ? Or whoever dreamed of using them constantly, lest he might again be attacked with it ? Would not prudence dictate to lay them aside, that they might not lose their influence on the system, and consequently their medicinal virtues ?

But smoking sometimes diminishes the secretions of the mouth, producing dryness and thirst, instead of moisture ; still it is used with the same perseverance as in the former case, and to obviate the same difficulty, an overburdened stomach. And such is the united influence of its stimulant and narcotic qualities, that *the thirst it occasions is not to be allayed by ordinary drinks, but wine, ale and brandy must be taken, to satisfy this unnatural demand.* Hence, smoking has, in many instances, been the sad precursor to the whisky jug and brandy bottle, which together have plunged their unfortunate victims into the lowest depths of wretchedness and wo.

I am well acquainted with a man in a neighboring county, whose intellectual endowments would do honor to any station, and who has accumulated a handsome estate ; but whose habits, of late, give unerring premonition to his friends of a mournful result. This man informed me that it was the fatal thirst occasioned by smoking his cigar, in fashionable society, that had brought him into his present wretched and miserable condition. Without any desire for ardent spirit, he first sipped a little gin and water, to allay the disagreeable sensations brought on by smoking, as water was altogether too insipid to answer the purpose. Thus he went on from year to year, increasing his stimulus from one degree to another, until he lost all control over himself ; and now he stands as a beacon, warning others to avoid the same road to destruction.

Smoking has been prescribed for spasmodic asthma, and undoubtedly with some success ; and the manner in which it affords relief in this distressing disease has been pointed out, when speaking of the narcotic and antispasmodic effects of this drug. But suppose it capable of relieving the paroxysm, when administered to a person unaccustomed to its deadly stimulus, it will by no means be followed by the same happy effect, when once its use becomes habitual.

But smoking has been the grand resort to secure the system from the influence of contagion ; and perhaps no power ascribed to it, has ever been so universally acknowledged. But upon what series of experiments are these pretensions founded ? From all the attention which I have bestowed on this investigation, I have been unable to discover any evidence of its utility in this respect, except what arose from the prejudices of the ignorant, or the obstinacy of those who are slaves to the practice of it. The bare assertion of Deimerbroek, 'that it kept off the plague,' without a single corroborative fact, would hardly be sufficient authority on which to establish a conclusion so important ; especially when we have the united experience of Rivernus, Chemot and Cullen, to prove the opposite of this position. Hence we conclude, that its properties in keeping off contagion, depend on its sedative powers, which it possesses in common with other narcotics, wine, brandy and opium. As these lessen sensibility, and sometimes allay anxiety of the mind, it is not impossible that in a very few instances they may have prevented the exciting causes of disease from taking effect. But what are these few, when compared with the multitudes whose nervous systems have been destroyed by this pernicious habit, and thus exposed to all the horrors of malignant disease.

Smoking also assuages the *tedium* of life. Here is the grand secret. Man fears to be alone ; and when left to his own solitary reflections, he dreads the result of self-examination. He flies for relief to his pipe, his cigar, his quid or his bottle, with the vain hope of escaping from himself. To accomplish an object so desirable, he hesitates not to *stupify* those noble faculties which he cannot hope to extinguish, and with which he has been endowed by the God of nature, for wise and benevolent purposes. And will you, gentlemen, by precept and example, longer sanction *such* a course of conduct,—conduct so degrading to us as intelligent beings, and as conservators of the public health ?

The third mode of habitually using tobacco, is *chewing*. In this manner all its deadly powers are speedily manifest

in the commencement of the practice, as has been already shown. In this mode, too, its nauseous taste and stimulant property excite and keep up a profuse discharge from the mucous follicles and salivary glands. Probably to this circumstance alone, is owing the superior efficacy of this mode of using this drug in the cure of toothache. But whether this enormous waste of the secretions of the mouth and fauces can be borne by the constitution with impunity, you, Gentlemen, are abundantly competent to judge. Physiologists agree that these secretions are intended to assist in preparing the aliments for deglutition, by rendering them sufficiently fluid, and afterwards, by their peculiar properties, to promote digestion and assimilation. The great increase of these just before and after eating, and the large quantities swallowed about that time, are unequivocal evidence of their importance to the digestive economy. Then what must be the state of that man's digestion, who, until seated at table, keeps his quid in his mouth, and immediately returns it thither after rising from his meal? And when we reflect, that large quantities of saliva strongly impregnated with this poison, and even particles of the substance itself, are frequently swallowed, what, again I ask, is the probable condition of such a person's digestive organs?

I know it may be said in reply, that such persons often consume large quantities of food, without experiencing any perceptible inconvenience; and I also know that they are often emaciated, notwithstanding the enormous portion of aliment they daily consume. Under these circumstances, the emaciation arises, either from the profuse discharge of saliva, or an imperfect digestion, or the combined influence of both. Hence, when a man of a corpulent habit, with a keen appetite, who is unwilling to forego his wine and to use moderation in his roast beef, applies for professional advice to prevent corpulence, medical men very naturally and philosophically direct him, if he persists in excess, to the use of tobacco, as a temporary relief against the direful effects of his gluttony and intemperance.

A clergyman of high standing informed me, that he acquired the habit of using tobacco in college, and had continued the practice for a number of years; but he found, by experience, his health materially impaired, being often affected with sickness, lassitude and faintness. His muscles also became flabby and lost their tone, and his speaking was seriously interrupted by an elongation of the uvula. His brother, an intelligent physician, advised the discontinuance of his tobacco. He laid it aside. Nature, freed from its depressing

influence, soon gave signs of returning vigor. His stomach resumed its wonted tone, his muscles acquired their former elasticity, and his speaking was no more annoyed by a relaxation of them.

A respectable man of my acquaintance, about forty years of age, who commenced chewing tobacco at the age of eighteen, was for a long time annoyed by depression of spirits, which increased until it became a settled melancholy, with great emaciation, and the usual symptoms of that miserable disease. All attempts to relieve him proved unavailing, until he was persuaded to dispense with his quid. Immediately his spirits revived, his countenance lost its dejection, his flesh increased, and he soon regained his health. Another man, who used tobacco very sparingly, became affected with loss of appetite, sickness at stomach, emaciation and melancholy. From a conviction that even the small quantity he chewed was the source of his trouble, he entirely left it off, and very soon recovered.

I was once acquainted with a learned, respectable and intelligent physician, who informed me, that from his youth he had been accustomed to the use of this baneful plant, both by smoking and chewing. At length, after using it very freely while indisposed, he was suddenly seized with an alarming vertigo, which, without doubt, was the result of this destructive habit. This afflicting complaint was preceded by the usual symptoms which accompany a disordered stomach, and a relaxation of nerves, with which, Gentlemen, you are too familiar to need a description here. After the application of a variety of remedies to little or no purpose, he quit the deleterious practice, and though his vertigo continued long and obstinate, he has nearly or quite recovered his former health. And he has never doubted but that the use of tobacco was the cause of all his suffering in this disagreeable disease. Many more cases might be cited, but sufficient has been said to establish the doctrine here laid down.

Having gone through with an examination of the *physical* influence of tobacco, let us now, for a few moments, attend to its *political* and *moral* influence.

1. *It is a costly practice.* The whole adult population in the United States is estimated at six millions, one half of whom are males. Allowing but one half of these to use tobacco in some form, we shall have one and a half millions to be taxed with this consumption. If we take into the account all who are in its use before they arrive at the period of adult age, it would swell the amount to two millions. Lest we should be accused of exaggeration, we will estimate the whole num-

ber of devotees at one million, who pay their daily homage at the shrine of this stupifying idol. The expense to the consumers of this drug varies, according to the quantity and mode of using. Those who are in the habit of smoking freely, and use none but the best Spanish cigars, pay a tax, I am informed by good judges, of not less than fifty dollars a year. While the moderate consumer of Scotch snuff pays from one to two dollars. Somewhere between these wide extremes, may be found the fair estimate of an average cost. If one fifth of the whole number of consumers should pay the highest estimate, it would amount to ten millions annually. Then if three-fifths pay but ten dollars a piece, it will amount to six millions ; and if the remaining fifth pay but one dollar each, we shall have two hundred thousand dollars more. These added together will make an aggregate of *sixteen millions two hundred thousand dollars*. In this estimate nothing has been said of another class of consumers, which delicacy forbids me to mention, (and I hope I shall receive their forgiveness for my neglect,) nor of the time wasted in procuring and devouring this precious morsel. But lest even this very moderate calculation should be considered extravagant, which is by many competent judges believed to be far too low, we will reckon the consumers at one million, and the average cost at ten dollars each a year, for the whole ; and then we have *the enormous tax of three millions of dollars*, to be annually paid in these United States for the useless consumption of this loathsome drug.

2. *This practice paves the way to drunkenness.* A few reasons have already been given, why *smoking* tends strongly to favor the introduction of ardent spirits. The dryness of mouth induced in some, is not the only case where a thirst for strong drink is produced. The great waste of saliva, occasioned both by smoking and chewing, has the same dangerous tendency. The fact that few of all the consumers of this plant are fond of those simple beverages so grateful to the uninitiated taste, and that most are inordinately attached to ale, wine and brandy, is sufficient evidence of the dreadful truth, that it is the faithful pioneer to intemperance. What though there are some few and honorable exceptions ; and what though there are many, who for a long time have used the poisonous plant, and have escaped the yawning gulf; still a sufficient number have been swallowed up to warrant the general conclusion. The few specifications already made above, might easily be increased a hundred fold.

Though every lover of tobacco is not a slave to rum, yet *almost every drunkard is a slave to tobacco*; and this is indirect

evidence that the habits are in a manner associated, or have a sort of natural affinity. If such be its tendency, what moral responsibility rests upon the man who shall recommend it, either by professional advice, or by his own example! What an infinitude of moral evil *must* follow in its train, if drunkenness be its legitimate effect! What woes, what sorrows, what wounds without cause, may spring into existence at your bidding, when you prescribe the habitual use of this baneful plant! By such a prescription you inadvertently open a fountain from which may issue streams, disturbing the peace of private families, pouring the waters of contention into peaceful and harmonious neighborhoods, embittering every condition of life, and poisoning every department of human society.

3. *It is an indecent practice.* To say nothing of the disagreeable contortions of countenance assumed by the great variety of snuffers, smokers and chewers; to say nothing of the pollution, inseparable from these habits, to the mouth, breath and apparel, to the house and its furniture, (all which are too familiar to require description,) I ask, where is the man making any pretensions to refinement, who would not blush to offend the delicate sensibilities of the *fair*, by smoking his pipe or cigar in their presence? True politeness would seem to require, moreover, that even the feelings of *gentlemen* should be respected. But all sense of propriety seems to have fled before the indulgence of this foolish habit. To such an extent has it obtained, that we meet it in the kitchen, in the dining room, and in the parlor; in every gathering of men of business; in every party of pleasure; in our halls of legislation; in our courts of justice; and even the sanctuary of God is sometimes polluted by this loathsome practice. It is impossible to walk the street without being constantly assailed by this noxious vapor, as it is breathed from the mouth of all classes in community, from the sooty chimney sweep to the parson in his sacred robe. You can scarcely meet a man in the street, with whom you have business, but he pours a stream of smoke into your face, exceedingly disgusting. And this he does too, without imagining that he transgresses the rules of politeness, or gives you any cause of offence.

In these habits we resemble the *Aborigines* of our country. They load their huge pipes with the dried leaves of this plant, and when lighted, they breathe the dark cloud of smoke from their mouth and nostrils, and as it curls around their head, ascending towards heaven, they present it as an offering to appease the anger of the Great Spirit. A mutual influence has resulted from our intercourse with the Indian. We have

taught him how to debase himself below the brute, and destroy the quiet of savage life by the use of our *whiskey*; and he, in return, has taught us to destroy our constitutions, and interrupt the harmony of civilized society, by the habitual use of his deadly narcotic.

Gentlemen, I have done. The subject, with a slight examination, is before you. I have plainly and fearlessly expressed my opinion, without intending to wound the feelings of a single individual. If your sentiments correspond with mine, you will assist in bringing this odious practice to the bar of public opinion. There let it be subjected to a severe, but dispassionate trial; and if on a cool and deliberate investigation, its pernicious tendency shall fully appear, then let the American people rise up, and with united voice pronounce its sentence of final condemnation.

McAllister's Dissertation on Tobacco.

S A S S A F R A S.

Laurus sassafras.



Fig. 1. A leaf. Fig. 2. The fruit.

beyond the Missouri, comprising an extent in each direction of more than 1800 miles, this tree is sufficiently multiplied to

The Sassafras, on account of its medicinal virtues and the beauty of its foliage, is one of the most interesting trees of the American forests. In the United States, the neighborhood of Portsmouth in New Hampshire, in the latitude of 43° , may be assumed as one of the extreme points at which it is found towards the north-east: in the Western Country it is met with one degree farther north. From Boston to the banks of the Mississippi, and from the shores of the ocean to Virginia, and to the remotest wilds of Upper Louisiana

be ranked among the most common trees. It is seen growing on lands of every description, from the dry and gravelly to the most moist and fertile, with the exception of such as are arid and sandy to excess, like the *pine-barrens* of the Southern States: neither is it found in the swamps that border the rivers by which these states are watered.

This tree attains its greatest developement on the declivities which skirt the swamps, and such as sustain the luxuriant forests of Kentucky and West Tennessee, where it arrives to the height of 50 or 60 feet, with a proportionate diameter. The bark which covers old trees is of a grayish color, and is chapped into deep cracks. On cutting into it, it exhibits a dark dull red, a good deal resembling the color of the Peruvian bark. The bark of the young branches is smooth and of a beautiful green color. The old trees give birth to hundreds of shoots which spring up at little distances, but which rarely rise higher than six or eight feet. The leaves of the sassafras are four or five inches in length, alternate, and petiolated. At their unfolding in the spring they are downy and of a tender texture. They are of different shapes upon the same tree, being sometimes oval and entire, and sometimes divided into lobes, which are generally three in number, and which are rounded at the summit. The lobed leaves are the most numerous, and are situated on the upper part of the tree. About New York and Philadelphia this tree is in full bloom in the beginning of May, and six weeks earlier in South Carolina. The flowers unfold before the leaves, and appear in small clusters at the end of the last year's shoots. They are of a greenish yellow hue, and are but slightly odoriferous. In this species of laurel the sexes are confined to different stocks. The fruit or seed is of an oval form, and of a deep-blue color, and is contained in small, bright, red cups, supported by peduncles from one to two inches in length. These seeds, when ripe, are eagerly devoured by the birds, and soon disappear from the tree.

The wood of this tree is not strong, and branches of considerable size may be broken with a slight effort. In the young tree the wood is white; in those which exceed fifteen or eighteen inches in diameter it is reddish and of a closer grain. It is not, however, in these respects to be compared with the oak and hickory. Experience shows, that this wood, stript of its bark, resists for a considerable period the progress of decay; and it is on this account employed for the posts and rails of rural fence. It is also sometimes used for the joints and rafters in houses built of wood. It is said to be

secure from the attack of worms: this advantage is attributed to its odor, which it preserves as long as it is sheltered from the sun and rain. Bedsteads made of it are said to be never infested with insects. But for these purposes the sassafras wood is not in habitual use, and is only occasionally employed. For fuel, it is held in little esteem, and it is only in the cities of the Southern States, which are not, like those of the north, abundantly furnished with fuel, that it is brought into the market: it is considered as wood of the third quality. Its bark contains a considerable portion of air, and snaps while burning like that of the chesnut.

The medicinal virtues of the sassafras are so well proved, that during more than two hundred years, since its first introduction into *materia medica*, it has maintained the reputation of an excellent sudorific, which may be advantageously employed in cutaneous affections, in chronic rheumatism, and in syphilitic diseases of long standing. In the last case it is always joined with *lignum vitae* and *sarsaparilla*. The wood is slightly aromatic and somewhat acrimonious, depending on a resin and an essential oil, but the smell and taste which are peculiar to the vegetable are more sensible in the young branches, and incomparably more so in the bark of the roots; this part of the tree therefore should always be preferred, for the wood appears to contain but a small degree of the qualities assigned it, and even this it loses after being long kept. From the bark of the roots, which is thick and sanguineous, the greatest quantity of essential oil is extracted: this oil, after long exposure to the cold, is said to deposit very beautiful crystals. The flowers of this tree when fresh have likewise a weak aromatic odor. A great number of people in the United States consider them as stomachic and efficacious in purifying the blood; and for this purpose, during a fortnight in the spring, they drink an infusion of them with a little sugar, in the manner of tea. The dried leaves and the young branches contain a mucilaginous principle nearly resembling that of the ochro. They are used by some people to thicken their pottage. An agreeable beverage may be made by boiling the young shoots in water, to which a certain quantity of molasses is added, and the whole is left to ferment: this beer is considered as a very salutary drink during the summer. Mucilage of sassafras pith is peculiarly mild and lubricating, and has been used with much benefit in dysentery and catarrh, and particularly as a lotion in the inflammatory stages of the ophthalmia. But except as a diaphoretic the powers of sassafras are very doubtful. It certainly has no antisyphilitic properties.—*Sylva Americana*.

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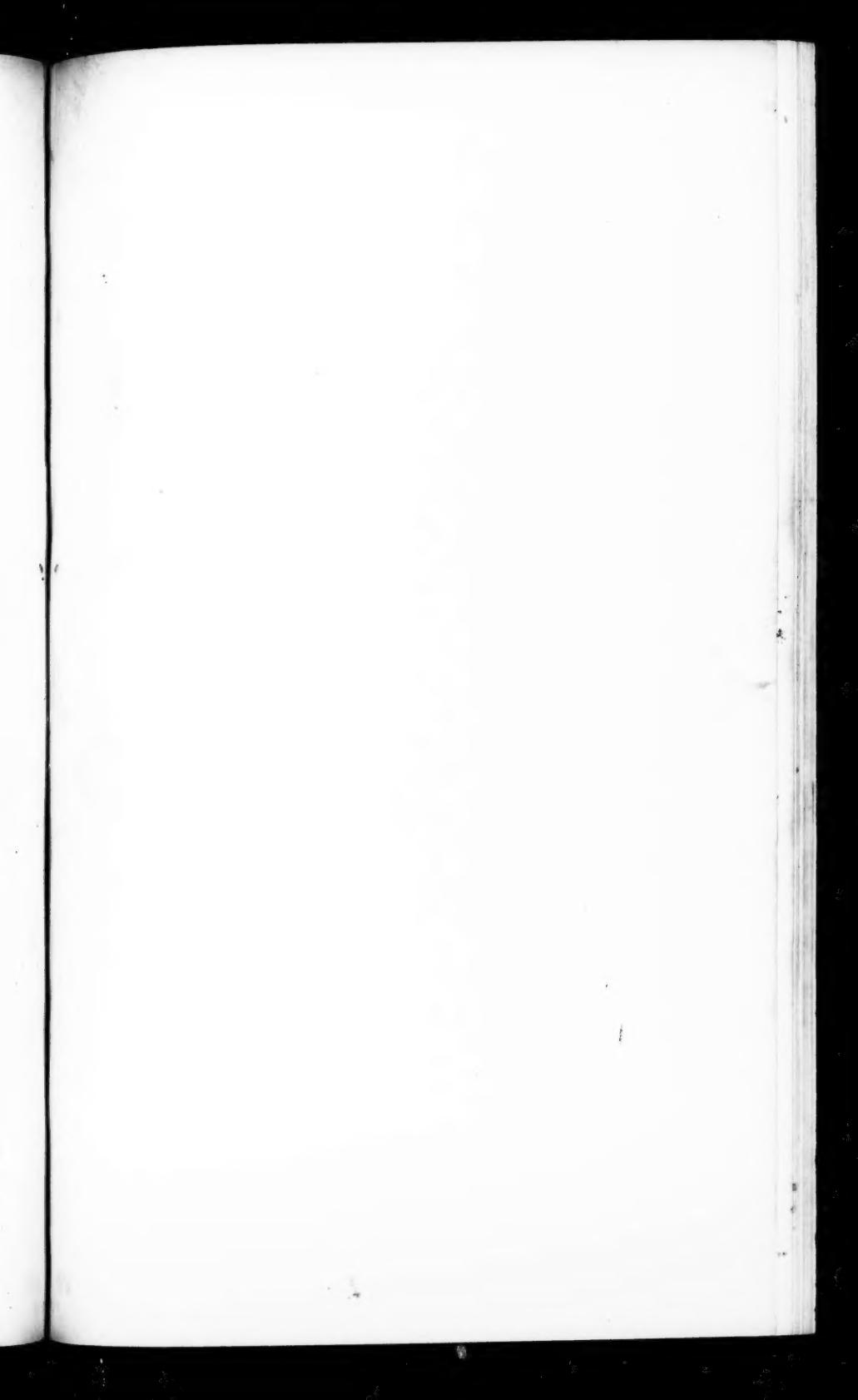
KEPT AT BOSTON, FOR FEBRUARY, 1832.

[From the Daily Advertiser.]

Day.	THERMOMETER.			BAROMETER.			FACES OF THE SKY.			DIRECTION OF WINDS.			RAIN. Inch.
	Morn.	Noon.	Even.	Morn.	Noon.	Even.	Morn.	Noon.	Even.	Morn.	Noon.	Even.	
1	19	28	24	30.38	30.38	30.40	Fair	Fair	Cloudy	N. W.	N. W.	N. W.	0.06
2	29	40	38	30.20	30.00	30.00	Fair	Fair	Fair	S. W.	S. W.	S. W.	
3	40	50	38	29.95	29.98	30.00	Fair	Fair	Rain	S. W.	S. W.	N. E.	
4	32	35	30	29.98	30.02	30.05	Cloudy	Cloudy	Snow	N. E.	N. E.	N. E.	0.16
5	28	24	14	29.95	29.90	30.02	Snow	Snow	Fair	N. E.	N. E.	N. W.	0.65
6	4	16	18	30.30	30.35	30.20	Fair	Fair	Snow	N. W.	N. W.	N. W.	
7	24	30	18	30.05	30.12	30.30	Fair	Fair	Fair	N. W.	N. W.	N. W.	0.04
8	17	24	18	30.39	30.40	30.04	Cloudy	Cloudy	Cloudy	N. W.	N. E.	N. E.	
9	24	24	14	30.35	30.29	30.06	Snow	Snow	Snow	N. E.	N. E.	N. E.	
10	14	39	17	30.02	30.09	30.30	Cloudy	Fair	Fair	N. W.	N. W.	N. W.	1.15
11	17	30	31	30.49	30.49	30.27	Fair	Fair	Fair	N. W.	S. E.	S. E.	
12	43	44	49	29.95	29.90	29.70	Cloudy	Cloudy	Rain	S. W.	S. W.	S. W.	
13	35	35	27	29.95	30.20	30.48	Fair	Fair	Fair	N. W.	N. W.	N. W.	0.67
14	27	34	30	30.58	30.59	30.55	Cloudy	Cloudy	Cloudy	N. E.	N. E.	N. E.	
15	30	24	27	30.49	30.30	30.40	Snow	Cloudy	Fair	N. E.	N. W.	N. W.	0.06
16	18	19	8	30.50	30.56	30.58	Fair	Fair	Fair	N. W.	N. W.	N. W.	
17	4	19	20	30.58	30.55	30.20	Fair	Cloudy	Cloudy	N. W.	N. W.	S. W.	
18	26	34	32	29.85	29.90	29.92	Cloudy	Cloudy	Rain	S. W.	S. W.	N. E.	
19	34	34	30	29.86	29.80	29.75	Rain	Rain	Rain	E.	E.	N. E.	0.67
20	30	33	32	29.76	29.77	29.51	Rain	Rain	Rain	N. E.	N. E.	N. E.	
21	18	27	16	29.91	30.00	30.25	Cloudy	Fair	Fair	N. W.	N. W.	N. W.	1.19
22	10	26	25	30.49	30.50	30.50	Fair	Fair	Fair	N. W.	S. W.	S. W.	
23	31	36	32	30.35	30.20	30.10	Snow	Rain	Cloudy	S. W.	S. W.	S. W.	0.46
24	10	7	6	30.49	30.62	30.65	Fair	Fair	Fair	N. W.	N. W.	N. W.	
25	8	22	20	30.58	30.40	30.22	Cloudy	Cloudy	Rain	N. W.	N. E.	N. E.	0.22
26	24	35	30	30.15	30.15	30.15	Fair	Fair	Fair	N. W.	S. W.	S. W.	
27	21	36	30	30.25	30.25	30.25	Fair	Fair	Fair	S. E.	S. W.	S. W.	
28	32	35	32	30.30	30.05	30.00	Cloudy	Fair	Fair	S. W.	N. W.	N. W.	0.20
29	42	30	30	30.10	30.30		Fair	Fair	Fair				

Depth of water fallen, 5.53 inches.

Hours of observation, at sunrise, 1 o'clock and 10 P. M.





Pendleton Lithog. Boston

OLIVE TREE.

(*Olea Europaea*.)